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CHEMTE
JANUARY 1

Managing your time 7 ☐ Here's a checklist worth framing, thanks to **Ferris**.

Organization's organization

The Conference Board 10 ☐ Companies, as well as individuals, belong to organizations. In 1983 CHEMTECH will introduce you to them.

Communicating: Inside and out 14 ☐ From the vantage point of Britain's former chief engineer and scientist, **Davies** observes how information flows both inter- and intrapersonally.

From here to 2000: The challenge of change 21 ☐ Will the CPI really turn its attention from "stuff" (commodities), to "things" (devices and materials), as **Hyde** suggests?

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Polymeric supports for catalysts 46 ☐ Molecular architecture comes into its full glory as chemists design the system: reactant–product–support. **Gates**'s group illustrates current practice.

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Batteries for energy storage: Part 1 58 ☐ The temporal mismatch between energy availability and energy need is ubiquitous. Electric batteries will be, too, so see what **Douglas** and **Birk** teach about them.

1 ☐ **The Industrial Chymist** agonizes . . . again . . . over being scooped.

3 ☐ **Heart Cut** in which **Small** and **Thyagarajan** explore sex habits of algae, tips for operating GCs, and more.

26 ☐ **View from the Top** in which leaders speak in concert to the president.

45 ☐ **The Science of the Possible** in which **Weisz** focuses on selenium. (Why selenium?)

OBC ☐ **The Last Word** in which **McCall** reveals conclusive evidence that the Russians are getting ahead of us.

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CHEMTECH

The Innovator's Magazine January 1983

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- ☐ Organization's organization
- ☐ The challenge of change
- ☐ Polymeric supports for catalysts
- ☐ Metal carbonyls revisited
- ☐ Batteries for energy storage

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How chemical vapor deposition creates surfaces 102 ☐ TiB_2, the fourth hardest material known, can be laid down in a uniform film if you grasp its phase relationships, say **Randich** and **Gerlach**.

The art of sulfur vulcanization 106 ☐ How empiricism and theory interact in designing structure for function is illustrated by the work of 1983 Queeny award winner **Coran**.

Photochemical water splitting 118 ☐ One nice way to store sunshine would be as H_2 generated from H_2O. **Grätzel** et al. are making progress.

Batteries for energy storage: Part 2 120 ☐ Modern electric cells are described by **Douglas** and **Birk**, who last month discussed progress in the field.

65 ☐ **The Industrial Chymist** wonders if *anybody* has the time.

68 ☐ **Write On** in which we get "organized," rescued, and chastized.

70 ☐ **Heart Cut** in which there's a new Small Business Initiative, a refrigerator that's only 8 in. on a side, and a selective Grignard-like reagent based on cerium.

100 ☐ **The Science of the Possible** in which **Weisz** shows how to predict chromatographic retention time.

OBC ☐ **The Last Word** in which **Groeger** relates a bit of our history.

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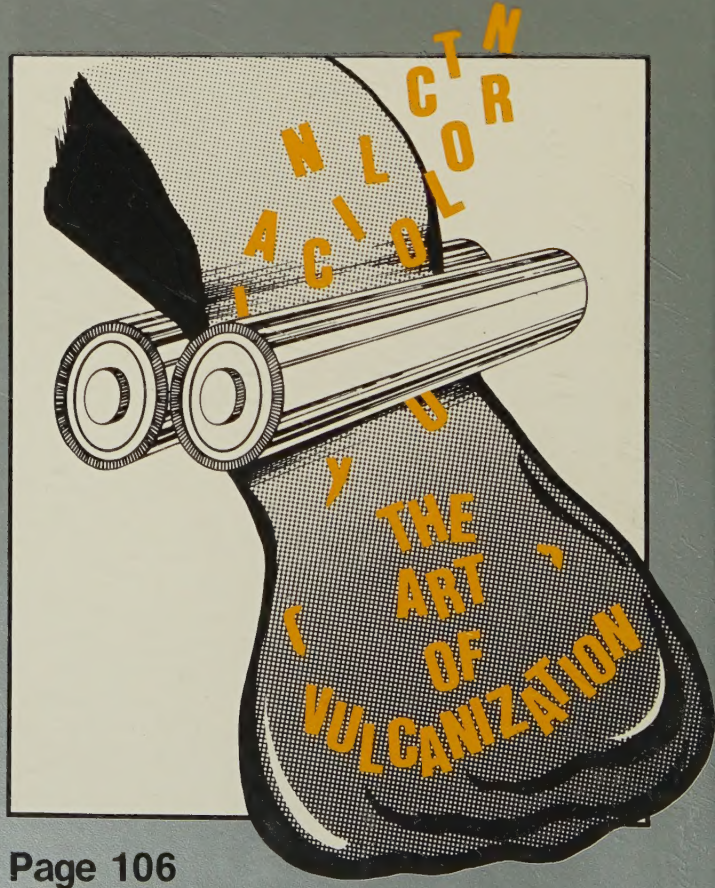

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129 ☐ **The Industrial Chymist** finds out why learning is painful . . . and suggests how to ease the pain.

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170 ☐ **The Divisions' Page** in which **Hedin's** exposition of the future of pesticides explains why the division may change its name.

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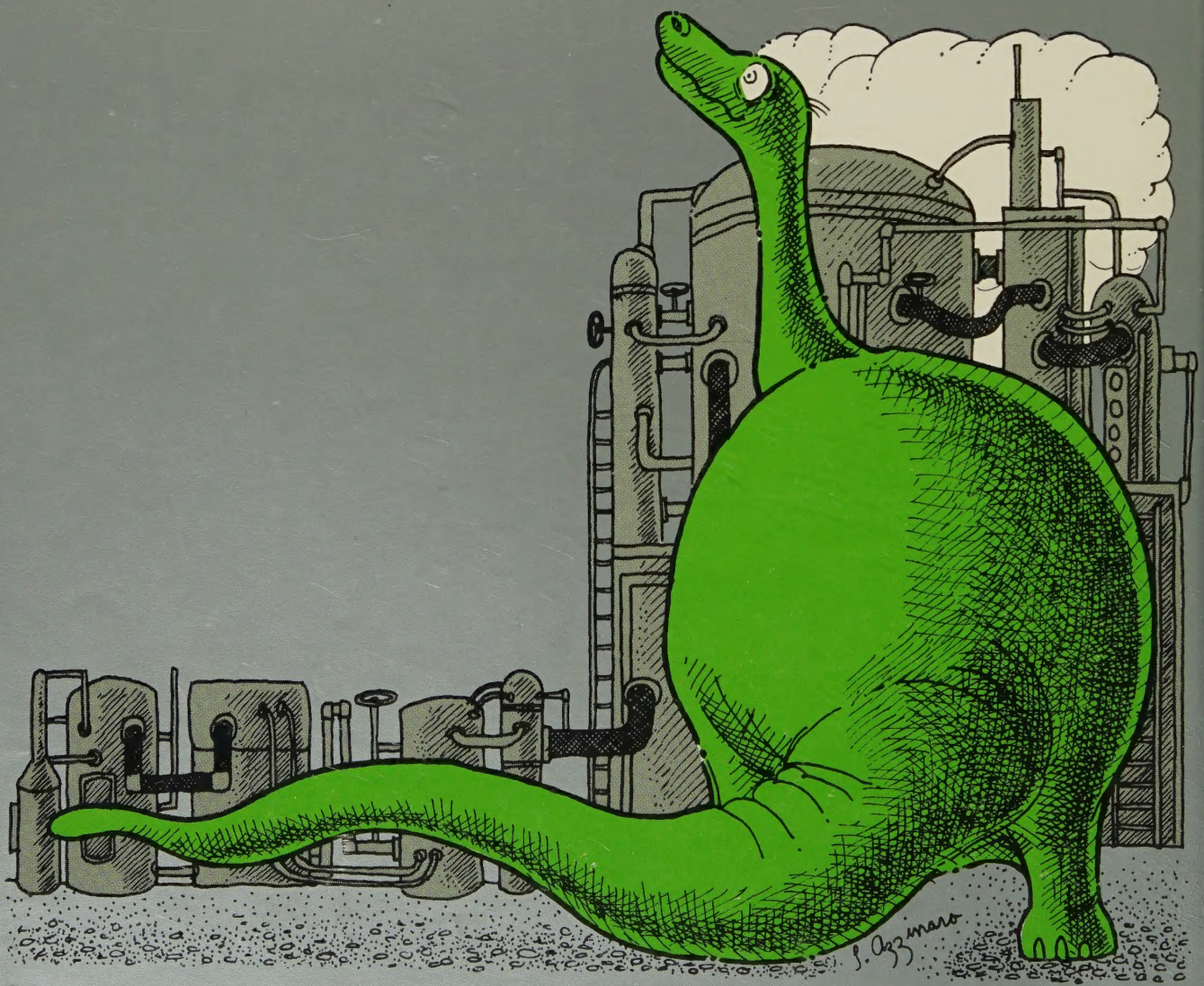

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How's your E.Q.? 202 ☐ Here's a chance to pit your brain against those of 11th and 12th graders.

Restructuring: The impossible dream 204 ☐ As firms scurry around to find a new business to relieve the problems of the old, many find that their "new" is "old" to others. Nevertheless, **Thackray** sees solutions.

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The polyethylene revolution 222 ☐ Yet another material has been moving aggressively into the marketplace. **Karol** tells about it, its comonomer, and its process.

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OBC ☐ **The Last Word** in which **Kanigel** marks the passing of a real friend.

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MAY 1983

The quinine caper 263 ☐ Only **Gergel** finds chemistry this exciting.

Staffing the innovative technology-based organization 266 ☐ There's a necessary division of labor in R&D and **Roberts** and **Fusfeld** show how personality dictates where the divisions should be made.

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Solid electrolytes and solid-state batteries 303 ☐ Now here's a materials challenge for you. **Liang** relates how far this new technology's come, how far it has to go.

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258 Challenge ☐ in which **Holt**'s concern is international gapsmanship.

260 Heart Cut ☐ in which **Kreps** and **Allen** talk about Newton's mad period, HPLC aromatics, Russia's problem, microwave lab ovens, and more.

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OBC The Last Word ☐ concerns unbreakable eggs and trunks-full of money.

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Learning about toxicity in humans from studies on animals — 350 ☐ It's all a matter of statistics, explains **Brown**. But is it?

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Make cellulosics thermoplastic — 366 ☐ Though wood can't really melt, you can make it behave as though it does, say **Shiraishi**, **Aoki**, **Norimoto**, and **Okumura**.

Extraction with supercritical CO_2 — 374 ☐ Even though you may never have seen liquid CO_2 above its critical point, it is a useful selective solvent. **Shimshick** uses it to open up a whole new tool box.

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323 ☐ **View from the Top** in which **Brooks** explains how the chemical distributor earns his keep.

326 ☐ **P.S.** Here are reactions to the bishops' letter on "defense."

327 ☐ **Heart Cut** in which **Kreps**, **Thyagaragan**, and **Small** tell us about plastics that age and those that don't, pills and when to take them, and new how-to books.

OBC ☐ **The Last Word** in which **Zabicky** shows what you learn from patents . . . in the Bible.

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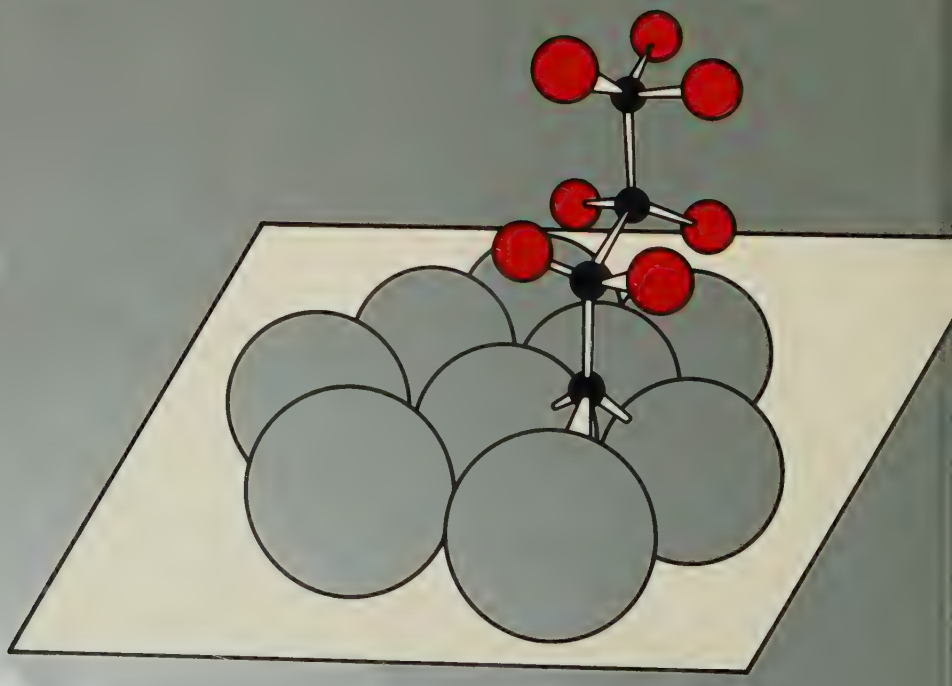

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Teaching industrial chymists 397 ☐ The pendulum is swinging away from teaching chemical science toward teaching, again, about chemicals. **Kolb** exemplifies.

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What makes a catalyst selective? 434 ☐ Homer Adkin put it this way: For a material to be a catalyst it must adsorb reactants, cause them to react in only one way, and rapidly discharge the product. **Sachtler** shows how to design things that do just that.

385 ☐ **The Industrial Chymist** reveals a pitfall of delegation.

388 ☐ **Heart Cut** in which **Thyagaragan**, **Bisio**, and **Roberts** delight in chemical materials, method, and mischief.

386 ☐ **View from the Top** in which **Harding** tells why plastics are cheap, relatively.

404 ☐ **Guest Editorial** in which **Fisher** suggests where to seek peace after you're convinced you'll not find it in technology.

410 ☐ **T & E** in which your staff disclose their top spots in Washington.

OBC ☐ **The Last Word** reports the hazards of the lower oxide of hydrogen.

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AUGUST 1983

The Abilene paradox 456 ☐ Is it any wonder that a nation founded by lawyers should find it difficult to manage agreement? This little story by **Harvey** and **Brooks** illustrates.

First analyze the problem 459 ☐ Problem solving is learned behavior. **Woods** provides the instruction.

From library to information service 464 ☐ When it comes to information "You only get what you pay for," says total charge-back advocate **Owens**.

Organizing the R&D–manufacturing–marketing interface 470 ☐ Somebody said that the action at interfaces is frantic. Nowhere is that more true than where R&D, manufacturing, and marketing meet. **Pearson** has ways to calm the waters, though.

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What you can do with glyoxal 478 ☐ You can't have much more functionality with two carbon atoms than you get with glyoxal. No wonder it has all the uses listed by **Guetté**, **Mattioda**, and **Metivier.**

CO_2 as solvent for oil recovery 482 ☐ The system CO_2–hydrocarbon offers some intriguing possibilities. **Orr**, **Heller**, **Taber**, and **Card** explore one of the most promising.

Making gasoline by fermentation 488 ☐ The right catalyst converts wet ethanol to high-octane gasoline, and you know where ethanol comes from. **Chen** shows how it's done.

Food in/energy out 494 ☐ **Bishop** brings home Input/Output analysis.

Accurate mass balancing in catalyst screening 498 ☐ Hydrogen consumption is the key to fuels processing, as we "go deeper into the barrel," but H_2 is hard to keep track of. **Palluzi** and **Matty** show how to do so at the R&D level.

The surface science of heterogeneous catalysis 502 ☐ Yogi Berra said about baseball, "You can see a lot by just looking." So too it is with catalysts. Here's what **Somorjai** and **Davis** see.

449 ☐ **The Industrial Chymist** encounters some strange things in his editorial peripatetics. Here are a few.

451 ☐ **Heart Cut** in which **Bisio**, **Kreps**, and **Thyagarajan** find thermophillic enzymes, chromatographic reactors, and several new, intriguing publications.

454 ☐ **View from the Top** in which **MacKinnon** traces the history of chemophobia.

497 ☐ **Write On** in which war-winning technologies are reassessed and patent credit is given where it's truly due.

OBC ☐ **The Last Word** **Orna** has created a crossword puzzle for chemists with a gift for words, and one for wordsmiths who know chemistry.

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CHEMTECH

The Innovator's Magazine AUGUST 1983

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SEPTEMBER 1983

Jet pilots don't use rearview mirrors 517 ☐ Using stories, **Weldon** makes some telling points about potential goals and growth.

On the circuit: An agony in eight fits 522 ☐ When one has lectured at a hundred ACS local section meetings—and **Davenport** has—well, see for yourself.

Individuals, groups, and technical innovation 528 ☐ In nature, the more diversified the system, the more stable it is. **Brand** and **Van Maanen** find a similar relationship in corporate organizations.

Carl Djerassi: Chemist and entrepreneur 534 ☐ Had da Vinci a Ph.D. in chemistry and lived in a capitalistic nation, he might have turned out like the subject of **Garfield**'s prolific pen.

Magnetic coatings and their applications 539 ☐ Join **Tochihara** as he explores replacement of print by "rust" coated on floppy discs, tape, and whatever's next.

Look what you can make out of silicones 542 ☐ Spare parts for the human body are first and foremost a challenge in materials management. Here **Arkles** uses them to illustrate the new direction in chemistry from "stuff" to "things."

The winning catalysts are multifunctional 556 ☐ Writing "cat." over a reaction arrow conceals the complexity of some of technology's most important formulated products. **Schuit** and **Gates** show how they get that way.

Where's the key to coal liquefaction? 562 ☐ The key to coal liquefaction is socioeconomic, but the technical keys may not be as complex as was thought. For example, you really don't need all that intimate structural detail, says **Cassidy**, who takes us right through process design.

Lab waste, RCRA, and the ACS 572 ☐ Here's a case of your Society helping the government to set policy that affects you. **Ream** shows how it all happens.

513 ☐ **The Industrial Chymist** suggests what to do when it dawns on you that you're not average.

514 ☐ **Heart Cut** in which a new editor, **Larry Casper**, joins the group.

568 ☐ **Write On** in which we look at the numbers game from three angles.

568 ☐ **Puzzle Answers** for chemists (and others) to check the accuracy of their crossed words, from last month.

OBC ☐ **The Last Word** provides a whole new route to good health.

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CHEMTECH

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OCTOBER 1983

An entry to foreign literature 582 ☐ It's easy to find out what kind of chemistry is being practiced in countries whose languages you cannot read. Just get hold of the translated journals enumerated by **Reynolds** and **Subramanyam.**

What? Me in industry? 585 ☐ Here's what really happens when you turn a professor loose in an industrial environment. Two views: One, professor **Kiely**'s; the other, employer **Protzman**'s.

The responsibilities of the technologist: Part 1 588 ☐ Science and technology differ in the questions that they address. Science asks "What is?" and technology, "What should be?" **Mingle** and **Reagan** treat concepts needed to answer the latter question.

What's that number mean? 598 ☐ The significance of figures is not as obvious as we might hope when the figures are derived experimentally. **Hendrix** explains.

Fermentation reactors 606 ☐ Before biotechnology can serve, it will have to be implemented on a commercial scale. Such implementation will occur in fermenters. **Sittig** looks at their state of development.

Protein via fish farming 614 ☐ **Dowsing '83** Here's an application of chemical technology to an emerging biological system. An overview is provided by **Weatherly.**

Use metal hydrides to recover hydrogen 621 ☐ There's little question that tomorrow's fuel supply will depend on the availability of hydrogen. Capturing it from process streams is the task **Santangelo** and **Chen** tackle.

The catalysis of coal gasification 624 ☐ When neither the structure of the starting material nor that of the product is fully explained, and the pathway is in doubt, it's not surprising that catalysis is not fully understood. **McKee, Spiro, Kosky,** and **Lamby** explain what is understood.

Thermoplastic elastomers 630 ☐ **The Innovators** Not long ago the title of **Legge**'s case history would have been a contradiction in terms. Now it implies lots of profitable products.

577 ☐ **View from the Top** in which **McCorvie** provides gratis the kind of consultation for which clients pay handsomely.

578 ☐ **Heart Cut** in which **Bisio** and **Kreps** look at the used instrument market, wood stoves, some dandy symposia collections, and local heat transfer.

594 ☐ **The Industrial Chymist** in which **Luberoff** asks "Why are the media all yelling FIRE now?"

OBC ☐ **The Last Word** in which we find out who is more equal than whom, from **Josefowitz.**

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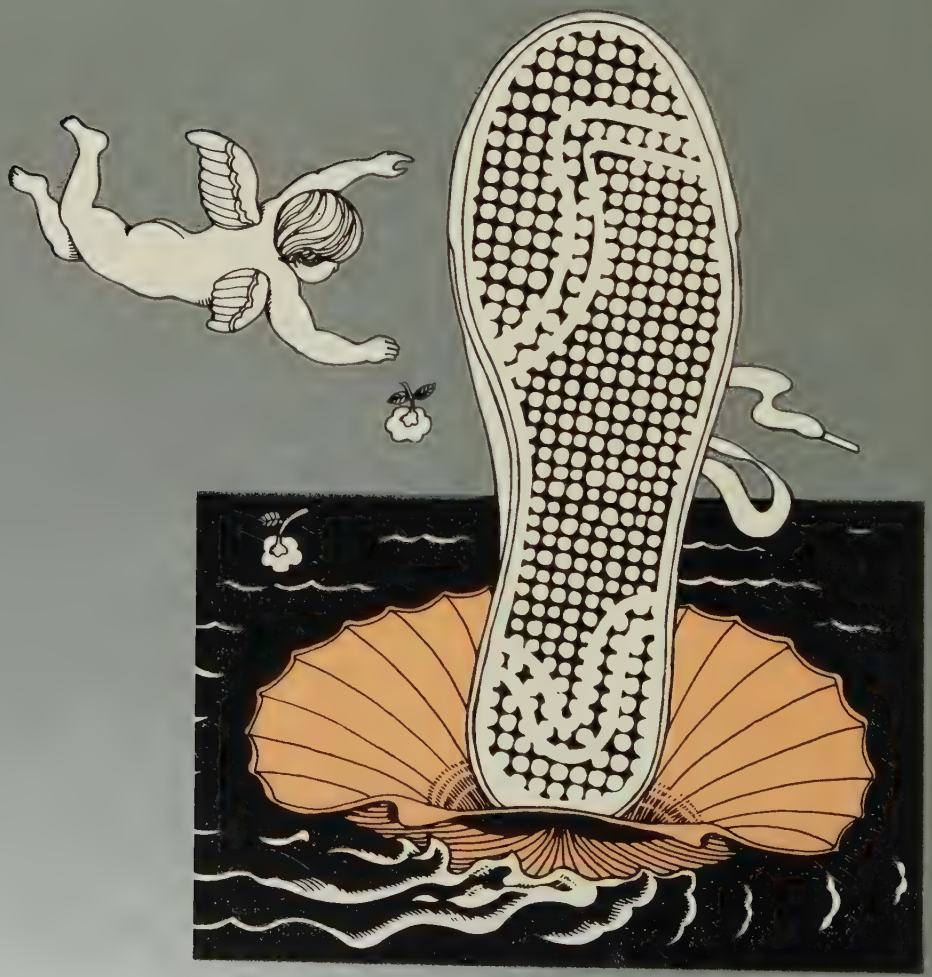
CHEMTECH

The Innovator's Magazine OCTOBER 1983



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The CAI is coming 650 ☐ How ACS helps keep chemists current is explained by **Chapman**.

A chemist conducts a health inspection 652 ☐ When technical types keep track of each other little bad can happen. **Solstad** shows how to do it.

Research policy and public policy 658 ☐ By focusing on pesticides, **Tschirley** illustrates how science and the public interact.

Profitability: A result, not a target 663 ☐ To develop a corporate strategy that satisfies "customers, suppliers, shareholders, employees, and the various other communities"—that's the task **Mueller** gives management.

Process industry (a) with (b) and (c) vs. engineering contractor 668 ☐ You pick the connective; **Kharbanda** shows how.

How to use SEM 670 ☐ Actually being able to see the structure of surfaces (where the action really is) is what makes scanning electron microscopy the valuable tool **Davidson** says it is.

Phenolics the new way 676 ☐ Look how far this thermoset has come in the 75 years since Baekeland's discovery. **Brode**, **Jones**, and **Chow** even make phenolic resins in water!

Doing chemistry in the gas chromatograph 682 ☐ A whole new reactor concept. Its uses are explained by **Coca** and **Langer**.

The winning catalysts are multifunctional: Part 2 693 ☐ By looking at the development and diffusion of ammoxidation technology, **Schuit** and **Gates** prove their point.

Running cars on vegetable oils 698 ☐ Whether sensible economics could be there remains to be seen: **Rand**, **Peters**, and **Schroer** concentrated on technical problems.

641 ☐ **The Industrial Chymist** remembers Christmases past.

642 ☐ **Write On** in which we hear about aging, peace, patents, and clean glassware.

645 ☐ **Heart Cut** in which **Bisio** and **Thyagaragan** have found antiviral agents, military materials, and chloroketones.

648 ☐ **View from the Top** in which **Kwiram** talks about how to bridge the industry–academe interface.

690 ☐ **The Science of the Possible** in which **Weisz** discusses piggyback molecules.

OBC ☐ **The Last Word** in which **Hartman** and **Sturtevant** show how to apply chemistry to gift lists.

The cover shows a micrograph of the continuous structure of a tin–iron alloy typical of that found in tinplate containers used for mildly acid foods.

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CHEMTECH

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The joys of SEM

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DECEMBER 1983

Joseph Priestley and the all-American lunch — 712 ☐ As in ham and eggs (where the chicken's dedicated and the pig is committed), Priestley discovered oxygen, but he invented soda pop. **Davenport** explains.

Changing retirement roles — 714 ☐ Retire to, not from, is **Payne**'s counsel.

Chemical education: An enterprise in deferred gratification — 718 ☐ Is there still virtue in patience? asks **Schwartz**, in his CMA Teaching Award address.

Boost the R&D payoff — 720 ☐ Does your R&D couple with your clients' *real* future needs? **Foster** shares ideas on how to improve the situation.

The responsibilities of the technologist: Part 2 — 726 ☐ The legal concept of "strict liability" has some unexpected hooks, individual and corporate, say **Mingle** and **Reagan**.

After the arms race — 732 ☐ Just how does a great modern nation wage peace? wonders **Ullmann**.

The future of innovation under TSCA — 738 ☐ As the chemical industries turn to nichemanship, **Umland** suggests an even bigger impact of regulation than we've seen.

Plant genetic engineering — 744 ☐ Recombinant DNA techniques will have a momentous impact in agriculture. **Carlson** shows why.

Repair, replace, sue, or be sued — 747 ☐ Though it focuses on handling fuel quality complaints, **Campbell** and **Zuback**'s technique can be used to tackle many others.

Troubleshooting the new plant — 750 ☐ Start-ups have problems. **Tsao**'s case study shows how to handle them.

A cyclic process for making hydrogen — 755 ☐ How about NO as a reducing agent? **Cook**, **Davis**, and **Wolfe** use it . . . repeatedly.

Olefin metathesis and polymer synthesis — 758 ☐ A reaction first demonstrated on C_3 olefin two decades ago is finding myriad uses in macromolecular chemistry. **Streck** illustrates.

705 ☐ **The Industrial Chymist** writes a letter to Santa . . . on behalf of the colleges.

706 ☐ **Write On** provides hints for formulators as well as the latest on controlling the sex of offspring, and on piezoelectrics.

707 ☐ **Heart Cut** features clips by **Thyagarajan** and **Small**.

711 ☐ **View from the Top** in which Albert **Einstein** addresses the class of 1938.

767 ☐ **1983 Index** Ever read an index? This one you can . . . profitably.

IBC ☐ **Author's Guide** CHEMTECH solicits your manuscripts.

OBC ☐ **Last Word** in which we wreck the walls with wows of folly.

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CHEMTECH

The Innovator's Magazine **DECEMBER 1983**